WHAT IS CLAIMED IS:

1. A method for monitoring non-coincident, non-stationary, process signals, comprising the steps of:

using an automated system to define a mean, variance, and length of a reference signal;

using an automated system to identify the leading and falling edges of a monitored signal and the length of the monitored signal;

using an automated system to resample the monitored signal to correlate the length of the reference signal to the length of the monitored signal;

using an automated system to compare the reference signal and the resampled monitored signal such that the reference signal and the resampled monitored signal are coincident in time with each other; and

using an automated system to compare the resampled monitored signal to the reference signal to determine whether the resampled monitored signal is within a set of predesignated operating conditions.

2. The method of claim 1, wherein the resampled monitored signal is compared to the reference signal using a sequential probability ratio test.

3. The method of claim 2, wherein the monitored signal and the reference signal comprise repetitive waveforms.

4. The method of claim 2, wherein the monitored signal and the reference signal comprise sinusoidal-based waveforms

5. The method of claim 2, wherein the monitored signal is compared to the reference signal by using a bounded angle ratio test to determine the resampling required of the monitored signal.

6. The method of claim 5, wherein the monitored and reference signals are derived from a biological function of a living animal.

7. The method of claim 6, wherein the monitored and reference signals are derived from the heartbeat of a living animal.

8. The method of claim 5, wherein the monitored and reference signals are derived from at least a portion of manufacturing process.

9. The method of claim 2, wherein the reference signal is defined by comparing a plurality of sample signals from at least one source.

10. A method for monitoring non-coincident, non-stationary process waveforms, comprising the steps of:

using an automated system to compare a plurality of sample repetitive waveforms;

using an automated system to define a reference repetitive waveform from the plurality of sample repetitive waveforms;

using an automated system to define a mean, variance, and length of a reference repetitive waveform;

using an automated system to identify the length of a monitored repetitive waveform;

using an automated system to identify the leading and trailing edges of the monitored repetitive waveform;

using an automated system to resample the monitored repetitive waveform to correlate the length of the monitored repetitive waveform to the reference waveform by using a bounded angle ratio test;

using an automated system to correlate the reference repetitive waveform and the monitored repetitive waveform such that the reference repetitive waveform and the monitored sinusoidal waveform are coincident in time with each other;

using an automated system to identify when the altered monitored repetitive waveform correlates to a predetermined set of operating conditions in comparison to the reference repetitive waveform.

11. The method of claim 10, wherein the altered monitored repetitive waveform is correlated to the reference repetitive waveform using a sequential probability ratio test.

12. The method of claim 11, wherein the monitored and reference repetitive waveforms are derived from at least a portion of an industrial process.

13. The method of claim 11, wherein the monitored and reference repetitive waveforms are derived from a biological process.

14. A system for monitoring non-coincident, non-stationary, process signals, comprising:

means for defining a mean, variance, and length of a reference signal;

means for identifying the length of a monitored signal and the leading and trailing edges of the monitored signal;

means for resampling the monitored signal to be in accordance with the parameters of the reference signal;

means for altering the resampled monitored signal such that it is coincident in time with the reference signal; and

means for determining whether the resampled monitored signal falls within a set of predesignated operating conditions relative to the reference signal.

15. The system of claim 14, wherein the monitored signal and the reference signal comprise repetitive waveforms.

16. The system of claim 15, wherein the means for determining comprises a software module applying a sequential probability ratio test to determine whether the resampled monitored signal falls within a set of preestablished range relative to the reference signal.

17. The system of claim 16, wherein the means for resampling comprises a software module applying a bounded angle ratio test to form the monitored signal in accordance with the reference signal.

18. The system of claim 16, wherein the monitored signal and the reference signal comprise repetitive sinusoidal-based waveforms.

19. The system of claim 15, wherein the reference signal is defined by comparing a plurality of sample signals from at least one source.

20. The system of claim 15, wherein the reference signal and the monitored signal are derived from a biological process.